2005-2006 School District Review Program
Digital School District Submission Guidelines

Please read through all of these guidelines before submitting digital school district data to the U. S. Census Bureau. If this document raises any issues or questions please send e-mail to: school@geo.census.gov, or contact Wes Flack at 301-763-8960.

Overview

In order to facilitate the accurate transfer of boundary data from our digital School District (SD) partners, and to facilitate their ability to analyze and understand the differences between Topologically Integrated Geographic Encoding and Referencing System (TIGER) and their local data, the Census Bureau has created new guidelines and procedures for the submission of digital SD information. In the past, the Census Bureau allowed the submission of local SD boundary files that were derived from older versions of TIGER/Line as well as some boundaries and data of unknown origins with little metadata. Locally-created GIS boundary files of various origins and limited metadata have sometimes proven to be very difficult to accurately integrate into TIGER due to topological inconsistencies, differences in basemap coordinates, and inconsistent data quality. To reduce the potential for errors or misinterpretation, the Census Bureau is requesting that our digital partners edit the enclosed TIGER extract (SD05_<ST>Anno_SDPOLY), and submit this file after they have done the analysis and editing necessary to ensure that the school districts can be accurately integrated into TIGER. If you are not able to participate in the 2005-2006 School District Boundary Review Program using this methodology, please contact us immediately.

We strongly encourage our partners to engage in a detailed and careful comparison of their school district boundary data to the TIGER extracts that we are enclosing with these procedures. Depending on the origins and uses of your state data, there may be some differences in the cartographic representation of school district boundaries that cannot, or should not, be reconciled during this school district boundary review cycle. Still, the Census Bureau is very interested in developing long-term digital GIS data-sharing partnerships and we want to make sure that the school district data in TIGER is as accurate as it can be given the resources available. Thus, we are very interested in how your state may be developing statewide school district data, and we are eager to contribute data and/or technical expertise wherever or whenever this may be appropriate. Even if we are not currently engaged in a School District Boundary Review Program cycle, please do not hesitate to

contact the geographic staff at the Census Bureau to discuss digital school district boundary data considerations.

Census Bureau Provided Shapefile Information

The following is general information about the Census Bureau provided shapefiles:

Media Format and Census Provided Shapefiles

The Census Bureau is providing all digital school district participants with a data DVD that contains extracts from a current version of TIGER (this data extract is the same as the data that will be available in the 2005 First Edition TIGER/Line files that will be available later this year). Below are the shapefiles included on the DVD:

- SD05_<ST>Anno_SDPOLY.shp – A shapefile consisting of a unionized layer of all SD boundaries for you state, and the <ST> represents your state's two-digit FIPS code (data dictionary below).

- SD05_<ST>Anno_all_lines.shp – A shapefile consisting of all TIGER feature lines for your state (data dictionary below).

Shapefile Spatial Reference Information

All shapefiles, provided by the Census Bureau, are in the following unprojected geographic based coordinate system:

- GCS_NAD83

    - Angular Unit: Degree (0.0174532925199433299)
    - Prime Meridian: Greenwich (0.000000000000000000)
    - Datum: D_North_American_1983
    - Spheroid: GRS_1980
    - Semimajor Axis: 6378137.000000000000000000
    - Semiminor Axis: 6356752.314140356100000000
    - Inverse Flattening: 298.257222101000020000

Please feel free to project these files into your local coordinate system/projection. In addition, after completing your updates, you may submit the updated SD boundary shapefile using your local coordinate system/projection provided that the shapefile's coordinate system contains a defined projection file (e.g., *.PRJ file) and/or spatial reference materials (i.e., metadata) accompany your submission.

Data Dictionary

The **SD05_<ST>Anno_SDPOLY.shp** contains the following attribute data:

Field	Type	Length	Description
State	String	2	FIPS State Code
County	String	3	FIPS County Code
SDUNI	String	5	LEA Unified SD Code
SDUNI_Name	String	90	Unified SD Name
SDELM	String	5	LEA Elementary SD Code
SDELM_Name	String	90	Elementary SD Name
SDSEC	String	5	LEA Secondary SD Code
SDSEC_Name	String	90	Secondary SD Name

If a particular SD level does not exist within your state, then all applicable SD level fields will be NULL (e.g., Arkansas only contains unified SDs, therefore, all elementary and secondary related fields are NULL).

The **SD05_<ST>Anno_all_lines.shp** contains the following attribute data:

Field	Type	Length	Description
TLID	Integer	10	TIGER/Line ID
CFCC	String	3	Census Feature Class Code
CFCC1	String	1	Census Feature Class Code, 1st Char
Name	String	90	Name of Linear Feature

This shapefile of all TIGER line features provides important reference information for you to use when updating our SD shapefile. Please utilize this in your analysis, and take note of the fact that because TIGER is a topologically integrated database, there are essentially no separate "layers." Thus, when a feature such as a school district boundary is coincident with another type of feature such as a street centerline, or a county boundary, etc., we do not want TIGER to have two features in slightly different positions when both features should be represented as one single line. By referring to this shapefile, you will be able to see where differences between TIGER and your data are attributable to differences in the underlying feature basemap. You will be able to see potential coincidence issues, and you will be able to ensure that your submission minimizes the potential for misinterpretation during the integration of your school district boundary data.

General File Setup Guidelines

Upon receipt of your SD DVD, please follow the setup guidelines listed below before beginning actual updates:

Reading the DVD:
Open the DVD and ensure that it contains the two aforementioned shapefiles for your state. Copy the shapefiles to a directory on your server or desktop's hard drive.

Open the Shapefiles in your GIS:

Due to the wide use of ESRI by our partners in the GIS community, and the ubiquitous use of the shapefile format as a medium for GIS data exchange, the Census Bureau is providing this school district program data in shapefile format. You should encounter no problems when importing these shapefiles into your local GIS software. However, if you are using GIS software that does not contain a shapefile translator, please contact the Census Bureau for further instructions (contact information above).

Changing Our Coordinate System to Match Yours:

As previously mentioned, our files are in GCS NAD83 format. The spatial referencing information is also stored in each shapefile's PRJ file. Most GIS software packages contain projection wizards or something similar that allow the user to transform file coordinate systems and projections. For example, if your office uses ArcView to update files, please turn on and use ArcView's 'Projection Utility Wizard' extension, or if you are using ArcGIS, please use its projection utilities in ArcToolbox. Because the enclosed TIGER extract shapefiles contain defined projection information in the PRJ file, and both ArcView and ArcGIS access the PRJ file for projection information, there is no need for you to define these parameters before changing the file coordinate systems.

Displaying Features based on CFCC1

Within the SD05_<ST>Anno_all_lines.shp file you may want to display different feature types based on the Census Feature Class Code (CFCC1). For example, you may want to display all roads in black, hydro features in blue, etc. Some of the CFCC1 values listed below may not even appear in the shapefiles you have, but for your reference:
“A” = Roads
“B” = Railroad

"C" = Miscellaneous Ground Transportation
"D" = Landmark
"E" = Physical Feature
"F" = Nonvisible Features (such as boundaries for incorporated places, counties, school districts, etc.)
"G" = US Census Bureau Usage (for internal programs)
"H" = Hydrography
"P" = Provisional Features
"X" = Not Yet Classified

For more detailed information on CFCCs, you can refer to pp. 3-28 – 3-45 of the most recent TIGER/Line documentation at:
http://www.census.gov/geo/www/tiger/tiger2004fe/TGR04FE.pdf

Guidelines for Updating the SD05_<ST>Anno_SDPOLY Shapefile

Below are general guidelines and tips for updating the census provided SD layer:

The Census Bureau realizes that many, if not all, local SD boundaries meet or exceed a higher level of coordinate accuracy than the boundaries provided by the Census Bureau. However, the Census Bureau is currently in the process of improving the positional accuracy of TIGER roads, hydrology, and in some cases, boundaries through a program called MAF/TIGER Accuracy Improvement Program (MTAIP). This program seeks to achieve a high level of street centerline coordinate accuracy in TIGER by acquiring and using, as a first priority among data sources, digital files prepared and provided by tribal, state, and local governments. The Census Bureau uses tribal, state, and local government GIS files that meet or exceed our street centerline spatial accuracy requirement of 7.6 meters CE95. If you would like to see up-to-date county-by-county status in MTAIP, please refer to the maps on the link below:

http://ftp2.census.gov/geo/maps/mtaip_status/

Because of the very significant spatial shifts that are presently affecting the TIGER feature network, the Census Bureau is presently requesting that you only make the following SD updates to our SD boundary file:

- New SDs
- SD Annexations/Corrections,
- Complex Consolidations or Dissolutions

Note: Detailed descriptions of the aforementioned SD updates are found in later sections of this document.

If you find that our SD boundary layer vastly differs from your SD layer/coverage and the reason is the coordinate accuracy, or lack thereof, please do not attempt to make these types of corrections to our boundaries. At a later date, when MTAIP is completed, the Census Bureau will begin to improve the spatial accuracy of its SD boundaries, as well as those of other geographic entities. Please, at this time, concentrate on submitting only valid SD related updates/changes to our SD boundary file.

Below are general guidelines for updating our SD boundary shapefile, and please note that all provided SD update examples originated from ESRI's ArcView 3.2. ArcView examples and updating techniques were used because:

1) Many of our SD participants use ArcView as a method for updating their SD boundaries,

2) Shapefile format is the native data format of ArcView, and

3) The lack of topology in ArcView makes it tricky, at best, to update polygon boundaries without creating gaps, overlaps, unsnapped points, and other undesirable spatial errors in the process.

This does not imply that the Census Bureau endorsees the use of ArcView 3.X over other GIS software on the market for updating our SD shapefiles. In order to maintain spatial relationships and ensure that your submitted updates are devoid of spatial inconsistencies, the Census Bureau recommends that all updates occur in a GIS that builds and maintains topology (e.g., ArcGIS 8.X or 9.X with Topology Manager, Arc/INFO workstation, Maptitude, or other comparable systems). If you are using a GIS software other than ArcView to perform updates, and you require technical assistance, please do not hesitate to call or email us using the contact information posted at the beginning of this document.

New SD Update

The Census Bureau will accept the submission of new SDs without the official Federal LEA ID numbers when the ID number has yet to be assigned. Please update the boundaries in the enclosed shapefile and update its record in the shapefile's attribute table using the new SD name in lieu of the Federal LEA ID number if none has been assigned to the new SD.

The following are examples and instructions, using ArcView, to create a new SD polygon from an existing SD polygon and updating its new record in the attribute table:

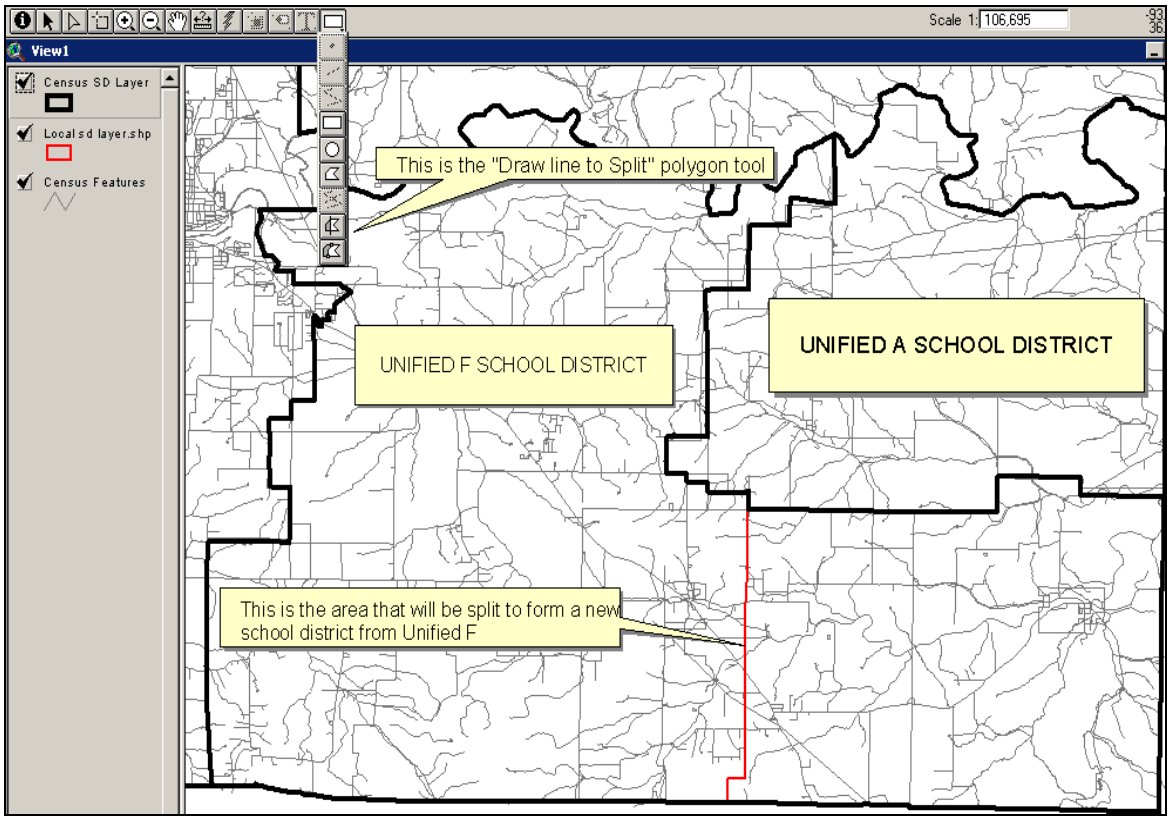
1) To create a new SD by splitting an existing SD into two pieces make sure that the census SD theme is active and start an editing session for that theme.

2) Next, ensure all referencing materials are present and visible, and zoom to the area to be split.

3) Select and use the "Draw line to Split" polygon tool from the menu in ArcView.

4) Using your SD theme and our features as reference split the polygon into two pieces. The red line below (Example 1) depicts a split of the Unified F SD into a new SD (Unified H SD). The "Draw line to Split" will create a new record in the table that requires updating, as well, with correct SD information.

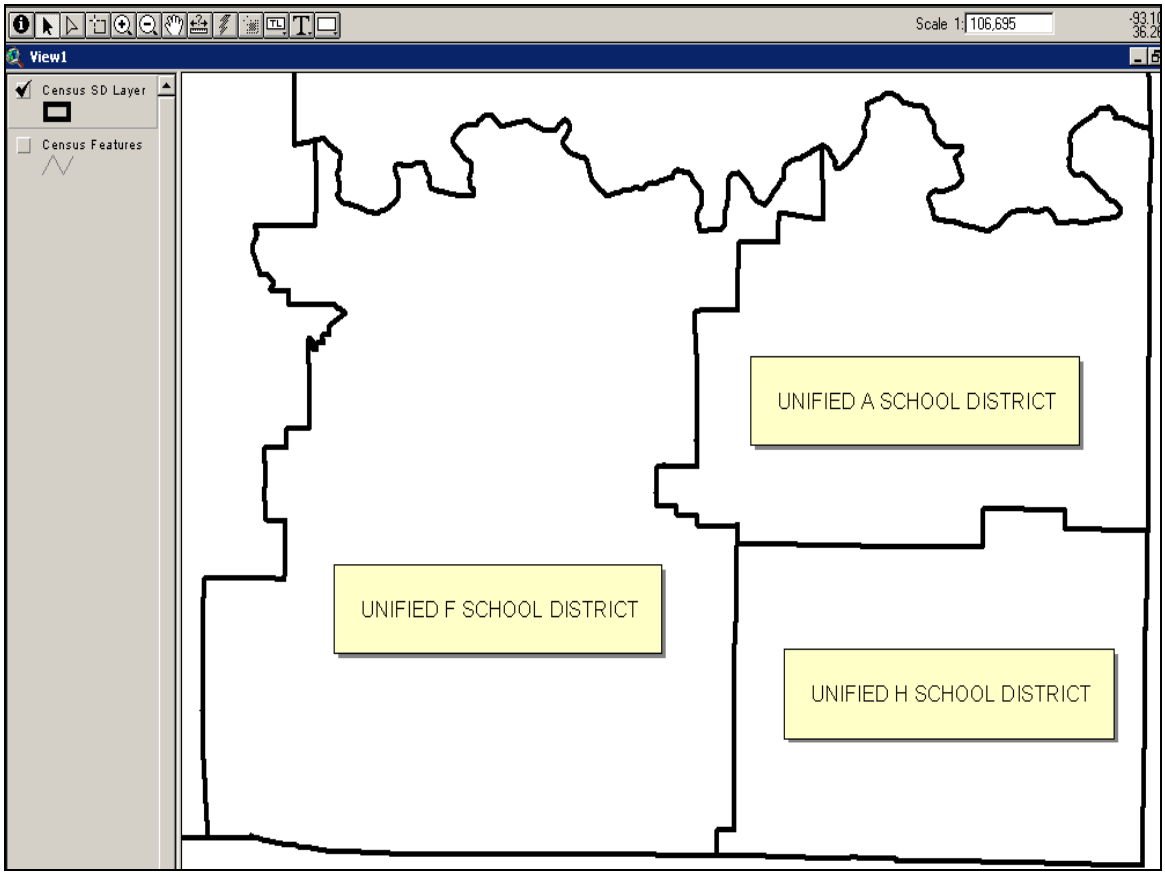
Example 1



In this example, ArcView's split polygon function splits Unified F SD into two polygon records (i.e., a new SD (Unified H SD) on the eastern half of the split). The analyst should use both the local SD and TIGER feature layers as references to ensure correct boundary placement in relation to existing features in TIGER and their local SD boundaries.

5) If this were the only update in the county, the TIGER SD layer should resemble the following in Example 2:

Example 2



This example depicts a new SD split from an existing SD. Remember to overwrite the duplicate polygon record created during the splitting process with the new SD attribute information.

SD Boundary Corrections

School district boundary corrections are simply SDs swapping area with each other. If using a GIS that builds and maintains topology, it shouldn't be difficult to align TIGER to your boundaries. However, because ArcView does not build or maintain topology of any kind, making even simple adjustments to polygons in ArcView can create spatial inconsistencies in the geographic data. The following examples and directions identify the simplest approach for making SD boundary corrections:

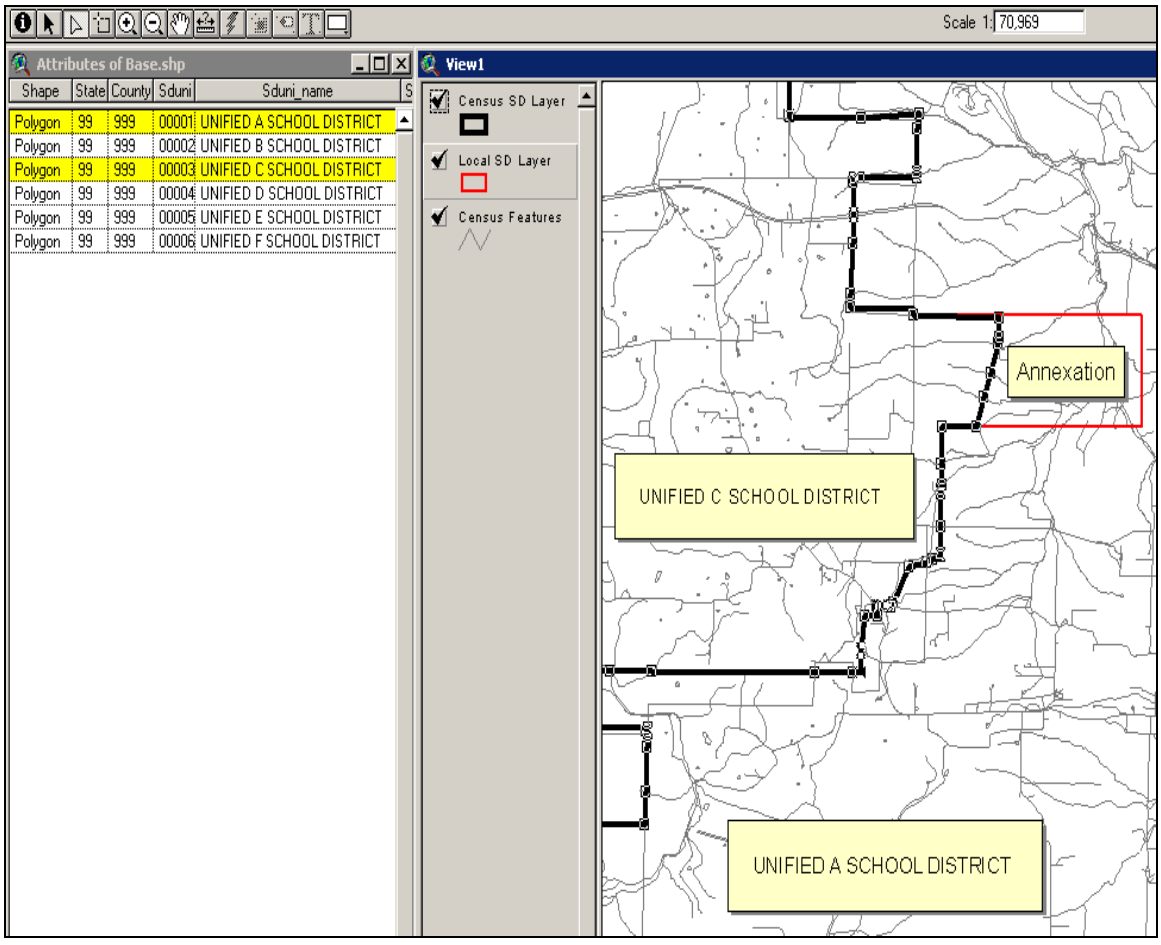
1) Start an editing session in ArcView for the TIGER SD layer if currently outside an editing session.

2) Open TIGER's attribute table and tile the windows so you can always see the selected TIGER attributes. This is critical in ArcView due to the lack of topology (i.e., spatial relationships) between boundaries.

3) Zoom to the annexation.

4) Select the "Vertex Edit" tool from the menu (i.e., the depressed icon below that has a hollow arrow without a tail), and select the boundary to adjust. If done correctly, you should see two records selected in the attribute table. If you do not, then clear selection, and redo this step, or you will create gaps and/or overlaps when adjusting the boundary. Example 3 below is an illustration of the aforementioned information.

Example 3



Note how the vertices become visible when the shared boundary is selected, and notice that the attribute table contains two selected records as well.

5) Continue to use the "Vertex Edit" tool to drag the census SD boundary to align it with yours.

6) Update other boundary differences using similar methods.

7) Make sure no new records have been created in the table.

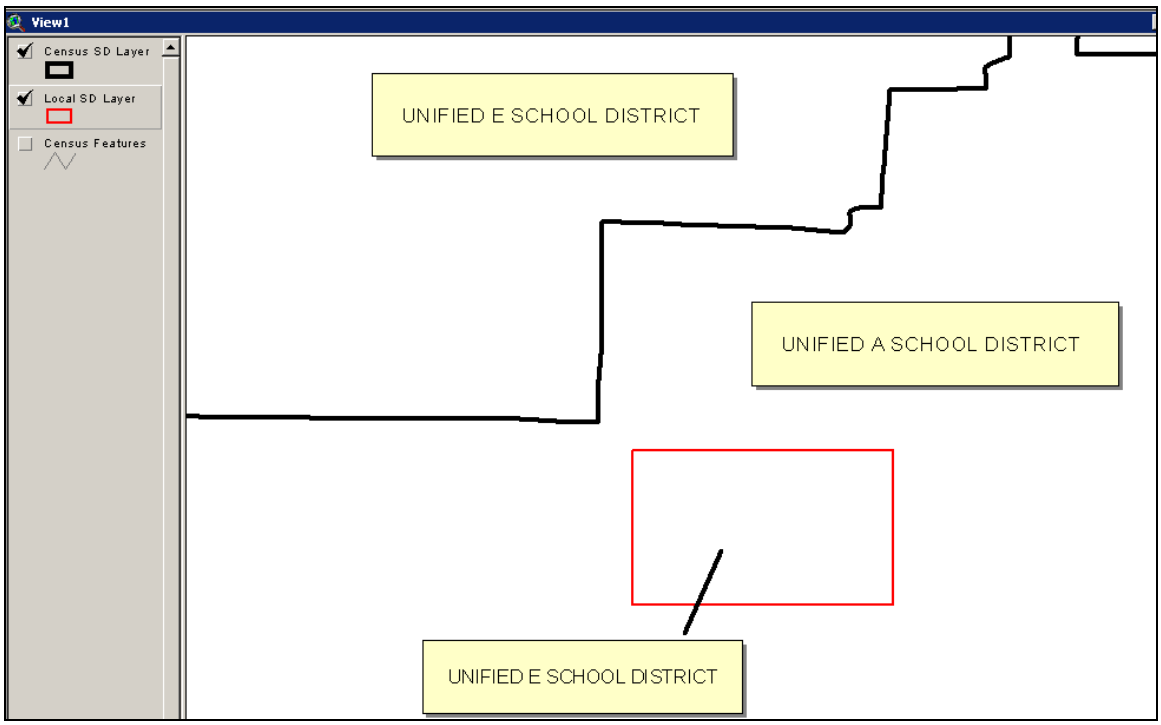
SD Boundary Corrections (Enclaves or Exclaves)

The following methods are for adding detached SD parcels to the census SD layer using ArcView:

1) Open an editing session for the census SD layer unless one is already open.

2) Zoom to the area where you will be adding the new detached parcel. Example 4 below illustrates a detached portion of Unified E SD (i.e., an exclave of Unified E SD) completely surrounded by Unified A SD area:

Example 4



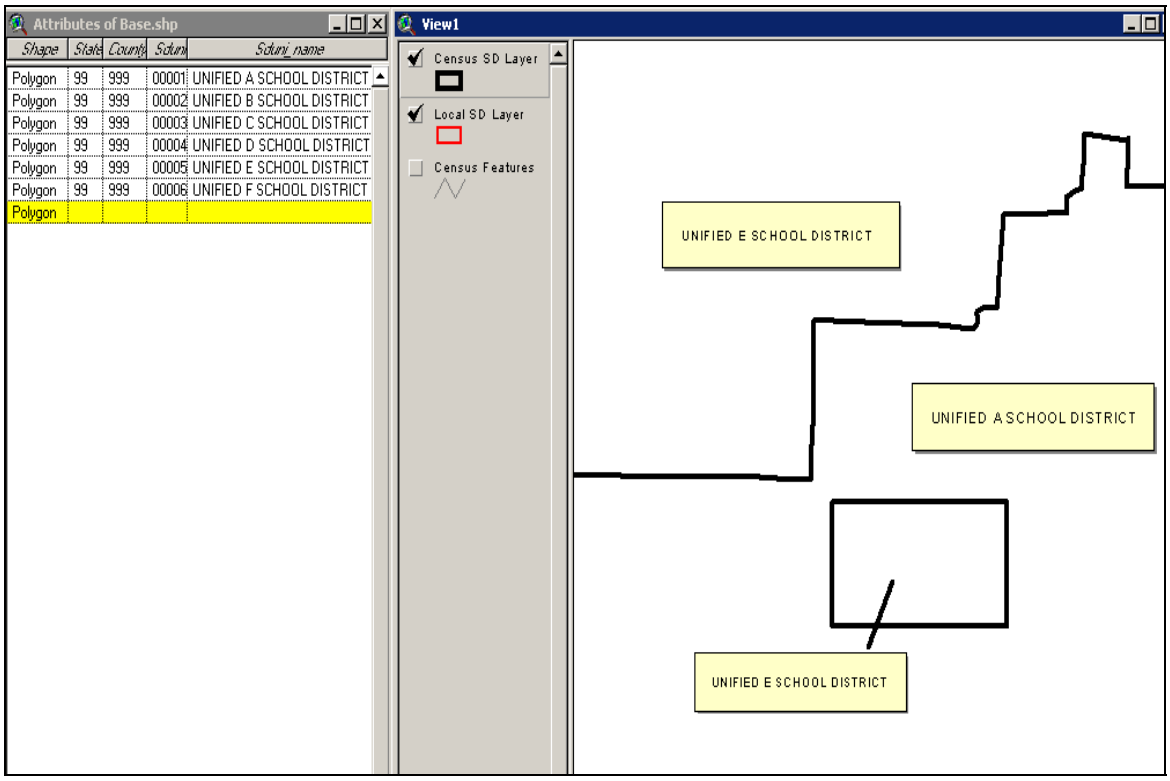
The area outlined in red represents an exclave of Unified E SD requiring update to the census SD layer

3) To add this parcel to the census SD layer, first, open the census SD attribute table and tile the windows as you did for simple annexations.

4) Select the "Draw Rectangle" tool from the menu, and draw a rectangle that covers the exact same parcel area in your file.

5) If done correctly, you will see a new record in the table (see Example 5 below), in which you will fill-in the new SD attribute information.

Example 5



Write required SD information into the blank cells for the record highlighted in yellow above

6) There is still one more thing required before you are done with this particular edit. While a new record exists in the table, the new polygon overlaps the existing Unified A SD polygon. With the 'View' window active, select the "Pointer" tool from the menu and click inside the polygon. Notice that the attribute table contains two records.

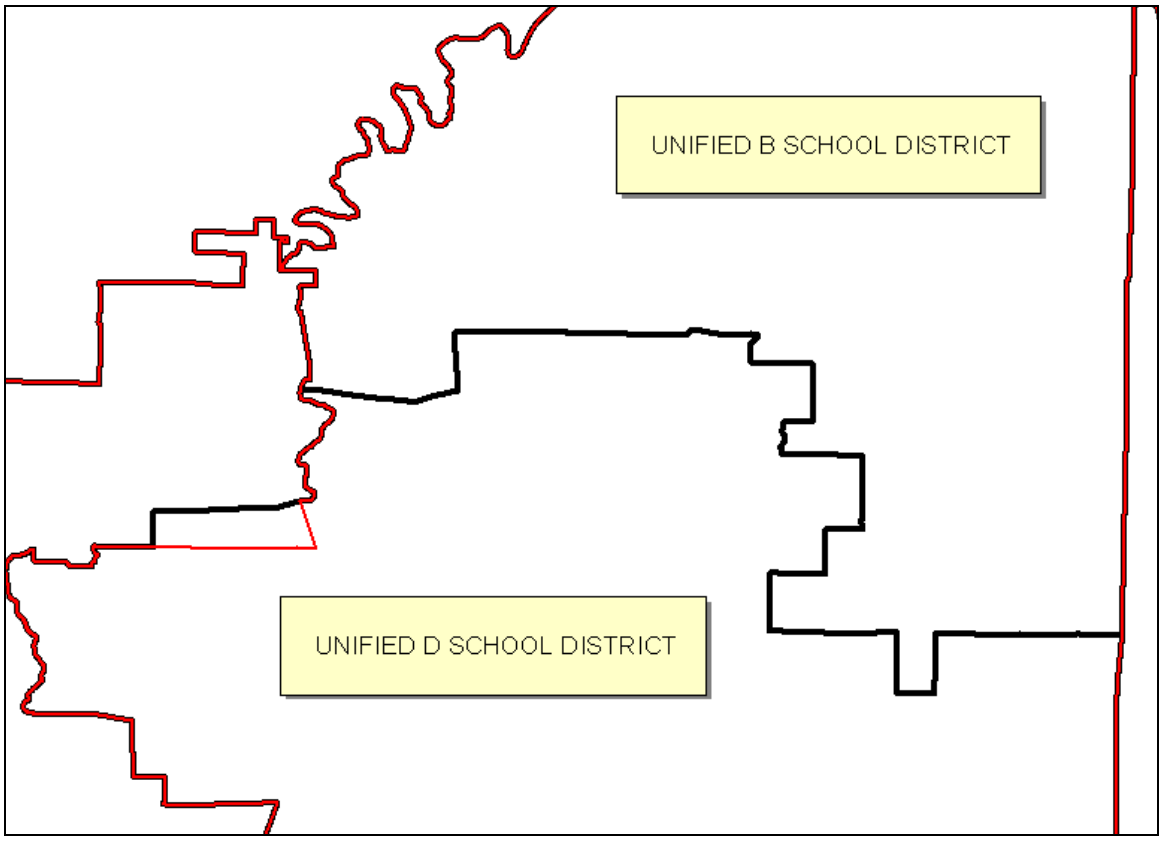
7) Next, under the "Edit" menu, select "Subtract Features." This will delete the overlap that the new polygon has with the Unified A SD.

Making Complex Consolidations and/or Dissolutions Updates

This section covers only complex SD consolidations and dissolutions that require additional boundary adjustments. If a county only contains simple consolidations and/or dissolutions, there is no need to perform updates to our shapefile. Please put all simple consolidations and dissolutions on a statewide list (note, a list of all consolidations and dissolutions is required, regardless, if your state contains those types of changes).

In Example 6 below, two unified SDs (i.e., Unified B and D SDs) are consolidating to form a new SD (i.e., Unified X SD):

Example 6



In addition to the consolidation of the two unified SDs, there is a boundary correction with a neighboring SD that requires updating as well.

1) To make the consolidation change, start an editing session for the census SD layer unless one is already open

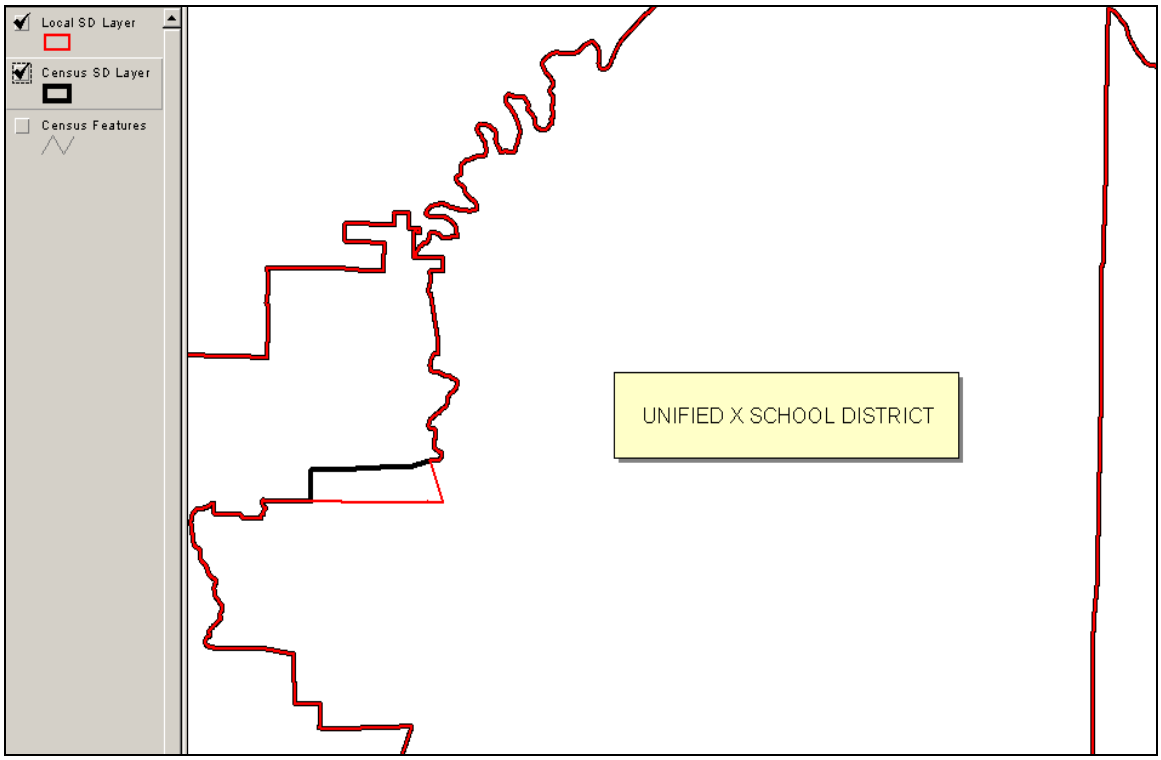
2) Select the "pointer" tool from the menu bar

3) Select, while holding down the shift key, the two polygons to dissolve

4) Select "Union Features" from the "Edit" menu.

5) If done correctly, you should see the following in Example 7 below:

Example 7



Make sure that you update the new combined polygon record in the census SD table with any new consolidation information that you may have for the new SD

Please follow the instructions listed under the "SD Boundary Corrections" section for information how to update any additional boundary corrections around the new consolidation.

If the aforementioned example was a SD deletion (i.e., dissolution) rather than a consolidation, then follow the same procedures above. However, ensure that the deleted SD record is not the record sent to us for update. In other words, review the table to make sure the newly combined polygon record contains the right SD information.

Guidelines for Submission of Updated Boundaries

The following are guidelines for the submission of the updated boundaries upon completion of your updates:

Data Format

While you received our boundaries and features in shapefile format, we don't expect you to convert them back into shape format if you used Arc/Info Workstation, ArcGIS, or some other GIS to make your updates. The Census Bureau recommends the GIS submissions be in the native data format, or the export format, of the system you used to make the updates.

For example:

- Arc/Info Export (*.E00) – If updates performed in Arc/Info
- Personal Geodatabase (*.MDB) – If updates performed in ArcGIS 8.X or 9.X
- ArcView Shapefile (*.SHP) – If update performed in ArcView

Coordinate System/Projection Definition

While our shapefiles are in unprojected geographic format, we do not expect you to change the coordinate system/projection back into GCS NAD83 format. However, if you do decide to submit updated files in your native coordinate system/projection, you must spatially define all coverages, geodatabase, or layers and provide metadata that contains spatial referencing information.

SD Lists

Please submit a list containing all SD consolidations and dissolutions for the state. This list should contain the name of the new SDs, their Federal LEA ID number, if known (if not known then the codes that were used represent new SDs in the digital file), its financially responsible grade range (see definition in the general SD Program instructions), the names and Federal LEA ID numbers of the SDs that are being annexed or merged, and the names and FIPS codes of the counties in which consolidation or annexation occurs.

File Content

Submit only those counties where changes or corrections have occurred to your SD boundaries since the last survey. The SD boundary shapefiles provided are split by county and contain county codes for easy selection and extraction into a new a layer. In addition, the Census Bureau requests that you additionally submit your statewide SD layer, the way it currently exists in your system, so we can use it as a reference and QA tool at our end (i.e., to

ensure that we make all your required SD changes). Therefore, we request the following files upon your completion of updates:

1) Our modified SD shapefile (or other data format),

2) Your statewide SD layer/coverage (i.e., the information used to update our layer), and

3) A list containing all SD consolidations and dissolutions for your state

FTP Information

1) Compress all update materials into one ZIP formatted file for each county.

2) Name the county-base ZIP files by using the two-digit state FIPS code and the three-digit county FIPS code. For example, the name for Arthur County, Nebraska should be 31001.zip (31 is the FIPS code for Nebraska and 001 is the FIPS code for Arthur County).

3) FTP files to the following FTP address:

   - ftp://ftp2.census.gov/pub/incoming/geo/SD/

   Please notify us at the email address below when you have submitted updates for your state:

   - school@geo.census.gov

If you have any questions or problems, please contact us at the e-mail address above or call Wes Flack at 301-763-8960.